F1

(19)日本国特許庁（ＪＰ）　(12)**公開特許公報**（Ａ）　(11)特許出願公開番号

特開平6－58821

(43)公開日　平成６年(1994)３月４日

(51)Int.Cl.[5]	識別記号	庁内整理番号	ＦＩ	技術表示箇所
Ｇ０１Ｋ　7/16		Ｓ　7267－2Ｆ		
7/00		Ｚ　7267－2Ｆ		

審査請求　未請求　請求項の数１(全　３　頁)

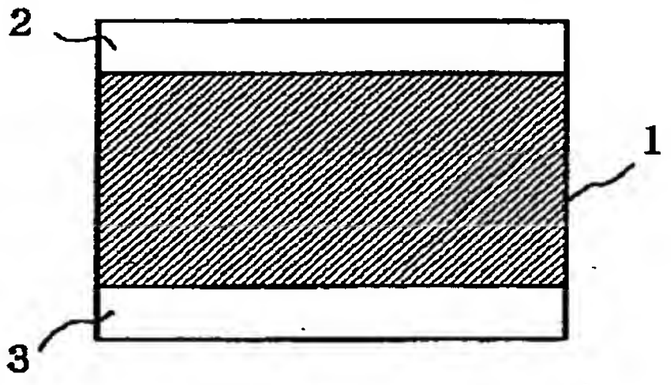
(21)出願番号　特願平4－209353

(22)出願日　平成４年(1992)８月６日

(71)出願人　000004237
日本電気株式会社
東京都港区芝五丁目７番１号
(72)発明者　水木　純一郎
東京都港区芝五丁目７番１号　日本電気株式会社内
(74)代理人　弁理士　岩佐　義幸

(54)【発明の名称】　温度センサー

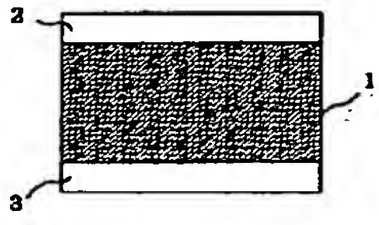
(57)【要約】
【目的】　簡単に、精度よく温度を測定する。
【構成】　ある温度で絶縁体－金属相転移を起こすヴァナジウム酸化物（V_2O_3）膜１の上面および下面に銅２，３を蒸着することでサンドイッチ構造にし、全体を被測温物に張り付けて銅２，３間の抵抗を測定できるようにする。



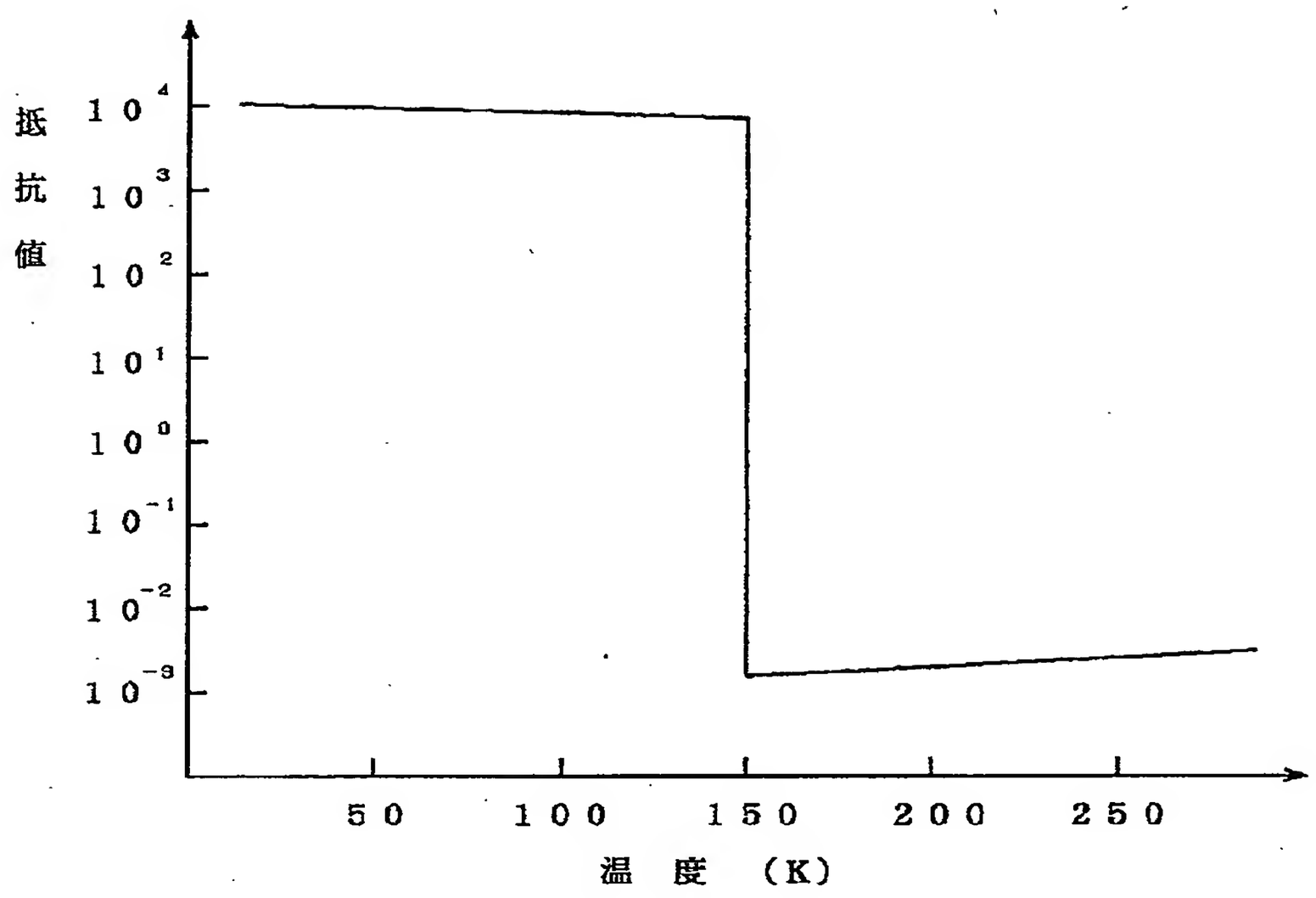
【特許請求の範囲】
【請求項１】ある温度で絶縁体－金属相転移を起こす物質と、
前記物質を挟み込む金属とからなることを特徴とする温度センサー。
【発明の詳細な説明】
【０００１】
【産業上の利用分野】本発明は、温度センサーに関するものである。
【０００２】
【従来の技術】従来、温度を測定する場合に温度センサーとしては、液体の熱膨張を利用した液体温度計、気体などの圧力の温度変化を利用した圧力温度計、熱放射を利用した放射温度計、熱起電力を利用した熱電対温度計などが、「理科学辞典」、第４版、１９９１年刊行、１９１頁に報告されている。
【０００３】
【発明が解決しようとする課題】しかしながら、上記の従来の温度センサーは、温度変化に対するセンサー出力の変化がわずかなために、それを精度よく観測することができないという問題点があった。
【０００４】さらに、ある温度を観測して、一定以上、あるいは一定以下でスイッチを入れたり、切ったりする場合には、温度センサーからのシグナルを電気信号に変えなければならず、複雑になるという問題点があった。
【０００５】本発明の目的は、このような従来の問題点を解決し、簡単に、精度よく温度を測定することのできる温度センサーを提供することにある。
【０００６】
【課題を解決するための手段】本発明は、ある温度で絶縁体－金属相転移を起こす物質と、前記物質を挟み込む金属とからなることを特徴としている。
【０００７】
【実施例】次に、本発明の実施例について図面を参照して説明する。
【０００８】図１は、本発明の温度センサーの一実施例を示す横断面図である。図１に示す温度センサーは、ある温度で絶縁体－金属相転移（モット－転移）を起こす物質であるヴァナジウム酸化物（V_2O_3）を膜状にしたヴァナジウム酸化物（V_2O_3）膜１の上面および下面に、金属である銅（Ｃｕ）２，３を蒸着することでサンドイッチ構造にしたものであり、全体を被測温物に張り付け、銅２，３間の抵抗を測定できるようにしたものである。

【０００９】ヴァナジウム酸化物（V_2O_3）膜１が絶縁体の場合には、膜間には電流は流れないが、ある温度Ｔｃで金属に相転移が起こった場合には、10^7 程度の抵抗変化があり、非常に簡単に相転移が起こったことを観測することができる。この相転移を起こす温度Ｔｃは、ヴァナジウム酸化物（V_2O_3）膜１に固有のものであり、正確に一つの値に定められる。ゆえに、抵抗変化を測定することで、正確に温度を測定することができる。
【００１０】図２は、本実施例の膜間の抵抗値の温度変化を示す図であり、１５０℃で金属から絶縁体に相転移しているのがわかる。
【００１１】
【発明の効果】以上説明したように本発明は、相転移に伴った抵抗変化が10^7 程度となるために、温度によって絶縁体－金属相転移を起こす物質を金属で挟んだものの抵抗を測定することによって、非常に簡単に、しかも正確に温度を測定することができるとともに、この抵抗変化をそのまま電流変化に変換することができ、温度変化を利用したスイッチに利用することができるという効果を有する。
【図面の簡単な説明】
【図１】本発明の温度センサーの一実施例を示す横断面図である。
【図２】本実施例の膜間の抵抗値の温度変化を示す図である。
【符号の説明】
１　ヴァナジウム酸化物（V_2O_3）膜
２　銅
３　銅

【図１】



【図２】



PATENT ABSTRACTS OF JAPAN

(11)Publication number : 06-058821
(43)Date of publication of application : 04.03.1994

(51)Int.Cl. G01K 7/16
G01K 7/00

(21)Application number : 04-209353
(22)Date of filing : 06.08.1992

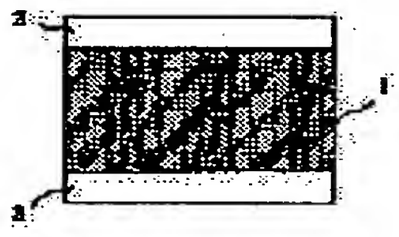
(71)Applicant : NEC CORP
(72)Inventor : MIZUKI JUNICHIRO

(54) TEMPERATURE SENSOR

(57)Abstract:

PURPOSE: To enable accurate measurement of a temperature simply by sandwiching a substance in which an insulator-metal phase tansition occurs at a certain temperature between metals.

CONSTITUTION: Coppers 2 and 3 are evaporated on the top surface and lower surface of an oxide film 1 produced in a film from a substance in which an insulator-metal phase transition occurs at a certain temperature, for example, vanadium oxide to make a sandwich structure, which enables the measuring of a resistance between the coppers 2 and 3. When the vanadium oxide is an insulator, no current flows through the oxide film 1. But when the phase transition occurs at a certain temperature, a large resistance change takes place, which allows the observation of the occurrence of the phase transition simply. The temperature of the phase transition is intrinsic to the oxide film and hence, can be determined as one value accurately. Thus, the temperature can be measured accurately by determining a change in resistance.



LEGAL STATUS

[Date of request for examination]

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's

decision of rejection]
[Date of extinction of right]

* NOTICES *

CLAIMS

[Claim(s)]
[Claim 1] The thermo sensor characterized by consisting of matter which causes insulator-metal phase transition at a certain temperature, and a metal which puts said matter.

[Translation done.]

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Industrial Application] This invention relates to a thermo sensor.
[0002]
[Description of the Prior Art] When measuring temperature conventionally, the pressure thermometer which used the temperature change of pressures, such as a liquid thermometer using the thermal expansion of a liquid and a gas, as a thermo sensor, the radiation thermometer using thermal radiation, the thermoelectric thermometer using thermoelectromotive force, etc. are reported to a "science study lexicon", the 4th edition, the 1991 publication, and 191 pages.
[0003]
[Problem(s) to be Solved by the Invention] However, since the above-mentioned conventional thermo sensor had a slight change of the sensor output to a temperature change, it had the trouble that it could not be observed with a sufficient precision.
[0004] Furthermore, a certain temperature was observed, when a switch was turned on or turned off, the signal from a thermo sensor had to be changed into an electrical signal, it is more than fixed or below fixed, and there was a trouble of becoming complicated.
[0005] The purpose of this invention solves such a conventional trouble, and is to offer simply the thermo sensor which can measure temperature with a sufficient precision.
[0006]
[Means for Solving the Problem] This invention is characterized by consisting of matter which causes insulator-metal phase transition at a certain temperature, and a metal which puts said matter.
[0007]
[Example] Next, the example of this invention is explained with reference to a drawing.
[0008] Drawing 1 is the cross-sectional view showing one example of the thermo sensor of this invention. The thermo sensor shown in drawing 1 the vanadium oxide (V2 O3) which is the matter which causes insulator-metal phase transition (motto transition) at a certain temperature on the top face and inferior surface of tongue of the vanadium oxide (V2O3) film 1 which were made into the shape of film Copper (Cu) which is a metal It is made sandwich structure by vapor-depositing 2 and 3, the whole is stuck on a temperature measurement-ed object, and it enables it to measure resistance between copper 2 and 3.
[0009] It is 107 when phase transition happens to a metal at a certain temperature Tc, although the current did not flow between film when the vanadium oxide (V2 O3) film 1 was an insulator. There is resistance change of extent and it can observe that phase transition happened very simply. The temperature Tc which causes this phase transition is the thing of a proper, and is correctly set to the vanadium oxide (V2 O3) film 1 at one value. Therefore, temperature can be correctly measured by measuring resistance change.
[0010] Drawing 2 is drawing showing the temperature change of the resistance between the film of this example, and is understood that it is carrying out phase transition to the insulator from the metal at 150 degrees C.
[0011]

[Effect of the Invention] The resistance change accompanying [as explained above] phase transition in this invention is 107. Since it becomes extent Although the matter which causes insulator-metal phase transition with temperature was inserted with the metal, while being able to measure temperature very simply and correctly by measuring resistance This resistance change can be changed into current change as it is, and it has the effectiveness that it can use for the switch using a temperature change.

[Translation done.]

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] It is the cross-sectional view showing one example of the thermo sensor of this invention.
[Drawing 2] It is drawing showing the temperature change of the resistance between the film of this example.
[Description of Notations]
1 Vanadium Oxide (V2 O3) Film
2 Copper
3 Copper

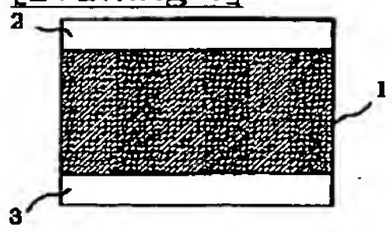
[Translation done.]

* NOTICES *

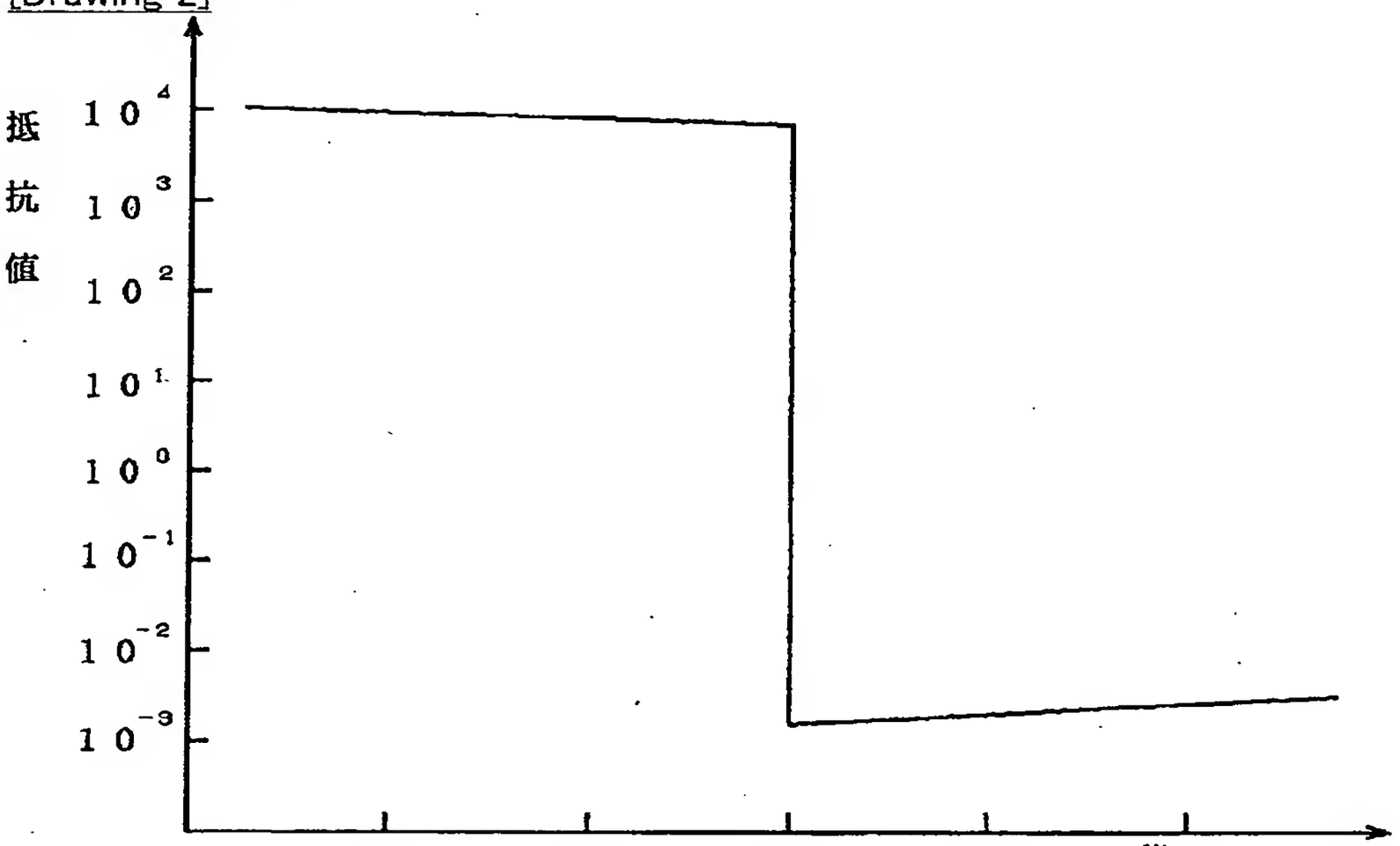
1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DRAWINGS

[Drawing 1]



[Drawing 2]



[Translation done.]